THE INFLUENCE OF SOME ROOTSTOCKS ON THE BIOLOGICAL POTENTIAL OF SOME ROMANIAN AND FOREIGN TOMATOES CULTIVATED IN THE GREENHOUSE

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In this doctoral thesis is described the activity carried out and the research results obtained as a doctoral student of the Doctoral School of Engineering and Management of Plant and Animal Resources from the Faculty of Horticulture, University of Agricultural Sciences and Veterinary Medicine Bucharest.

This paper has a modern research topic, in the trend of current international researches from the field of solano-fruit vegetable seedling grafting.

The research was carried out in two of the research and development greenhouses in vegetable growing belonging to the laboratory of horticultural crops in protected areas and in the laboratory of biochemical analysis of the Research - Development Institute for Industrialization and Marketing of Horticultural Products - HORTING.

- Grafting was performed with biological material consisting of several scion and rootstocks, as follows:
- - 2 scions of the *Solanum lycopersicon* species, F1 tomato hybrids, respectively Abellus, Dutch hybrid marketed by Rijk Zwaan and Siriana, Romanian hybrid created at the Buzău Vegetable Research and Development Station (SCDL Buzău),
- - 4 rootstocks of the *Solanum lycopersicon* species, of which an imported F1 hybrid (Emperador), a Dutch hybrid sold by Rijk Zwaan and 3 Romanian tomato lines (L542, L543 and L544), Romanian creations of SCDL Buzău being tested for grafting nightshade vegetables at ICDIMPH-Horting Bucharest.

90 plants were used in 3 repetitions with 30 plants for each variant:

V1 - Abellus (control),
V2 - Abellus x L542,
V3 - Abellus x L543,
V4 - Abellus x L544,
V5 - Abellus x Emperador,
V6 - Siriana (control),
V7 - Siriana x L542,
V8 - Siriana x L543,
V9 - Siriana x L544,
V10 - Siriana x Emperador.

Seedling greenhouse (interior) from ICDIMPH – HORTING

New greenhouse from ICDIMPH – HORTING

ABELLUS

SCIONS

SIRIANA

ROOTSTOCKS

L542	L543	L544

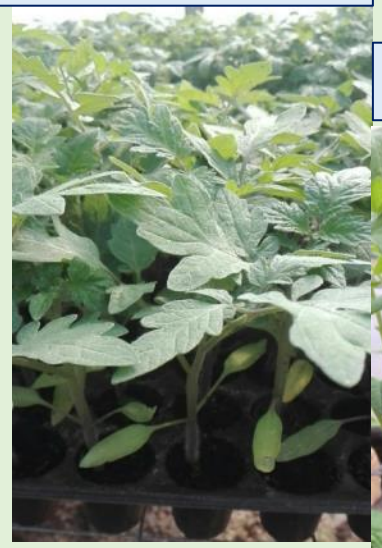
ROOTSTOCKS

Empeardor

L542

L543

L544

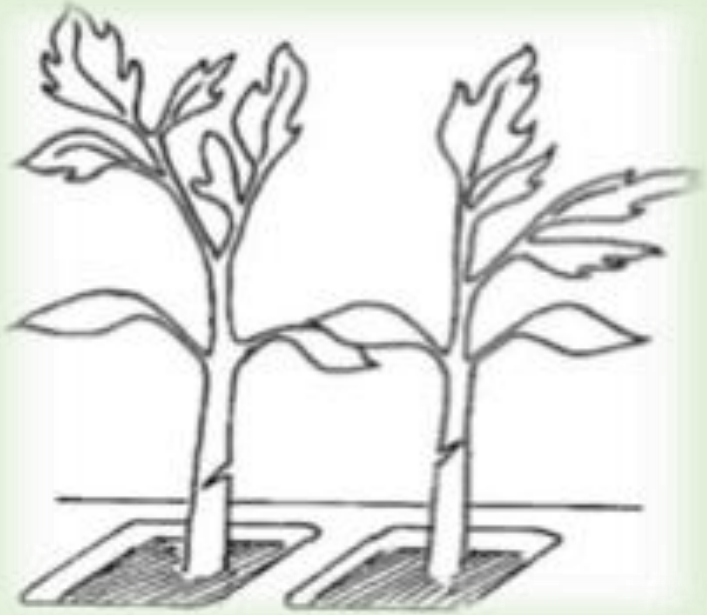


SCIONS

Siriana

Abellus

GRAFTING METHOD



GRAFTED TOMATOES

Conclusions and recommendations

• Conclusions to the experience regarding the compatibility of scion x rootstock for grafting some tomato seedlings.

Of all the experienced rootstocks, the Dutch rootstock Emperador had the best germination energy, followed by the L542, L543, L544 rootstocks, among the grafts, the Abellus hybrid plants had the best germination energy, then the Siriana scion plants which had an energy weaker germination.

The optimal data for the technological stages of the grafting process of the experienced tomato cultivars were established, for the period February - March in the southern part of Romania.

The percentage of callus of the plants between 95 and 98% for manual grafting and between 90 and 98% for mechanized grafting shows that the less qualitative plant emergence of Romanian cultivars led to a difficult correlation of plant diameters.

The phenomenon of incompatibility was not due to the genetic differences between the graft and the rootstock, but to the technological factor, respectively the grafting.

The grafted tomato seedlings had higher values at all the growth parameters observed (root length, package diameter, mass) at the time of transplanting into the greenhouse soil, compared to the control plants, the non-grafted tomato seedlings.

- Conclusions to the experience regarding the compatibility of scion x rootstock in the grafted tomato culture.

The rootstock influenced the resistance of tomato plants to soil vascular diseases, with the exception of the Siriana x L544 grafting combination, in which several plants were replaced compared to the other variants. Therefore, rootstocks had a positive influence on resistance to soil phytopathogens.

The rootstock influenced the fruit production on the plant.

All variants of grafted tomatoes had superior yields, of which the variant grafted on the Emperador rootstock obtained the highest production compared to the non-grafted tomato variant, control.

The quality of the fruit (extra and 1st class) was influenced by grafting, positive by the Emperador rootstock and negative by the Romanian rootstocks.

The rootstock influenced the appearance, texture and taste, but the differences were insignificant.

In terms of precocity, the non-grafted variants were earlier compared to the grafted variants, in both tomato hybrids, Abellus and Siriana; all the Romanian lineas (L542, L543, L544) and the Dutch one (Emeperador) printed late. Therefore, the rootstock has a negative effect on the timeliness, it imparts a delay of the first harvest.

The right rootstock (Emperador) has positive effects on the nutritional quality of the fruit compared to non-grafted tomatoes and grafted tomatoes on other rootstocks (L542, L543 and L544).

The soluble dry matter content of the fruit produced by the Siriana grafted tomatoes on all rootstocks was lower compared to the nongrafted tomatoes, control.

The carbohydrate content was in both cultivars, Abellus and Siriana, grafted on all rootstocks, slightly higher compared to the fruits from non-grafted plants.

The vitamin C content of the non-grafted tomatoes (control) was slightly higher compared to that in grafted tomatoes.

Rootstocks have positively influenced the resistance of plants to soil diseases and pests (*Fusarium oxysporum* f.sp. *lycopersici* and *Meloidogyne incognita*).

Proper rootstock has positive effects on crop resistance compared to the non-grafted tomatoes.

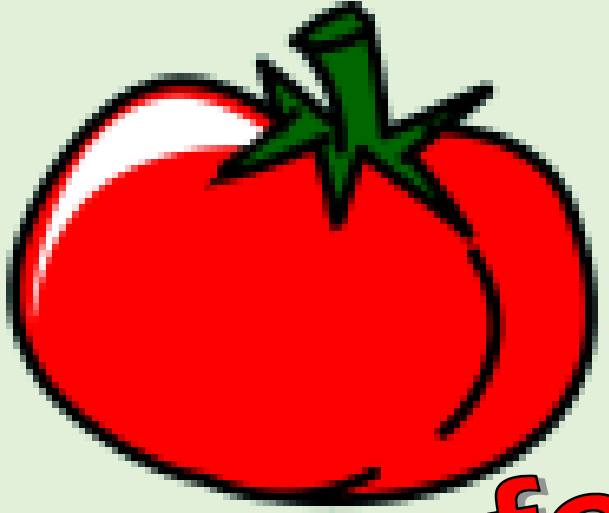
Recommendations.

Due to susceptibility to some soil diseases and pests, it is recommended to graft on these rootstocks resistant to some biotic stress factors (*F. oxysporum* f. sp. *lycopersici* and *M. incognita*) for certain tomato crops grown in protected areas, on the ground without chemical or thermal disinfection, because in Romania it is forbidden to use methyl bromide in the soil treatment for the plant protection.

For the grafted tomato seedling production is recommended to know the germination capacity of the scion and rootstock seeds to obtain a similar diameter of the stems at the grafting time and the success in grafting. It is recommended to use good quality seeds and a test of seed germination, so it is possible to establish the works and correlate the plants.

When planting grafted tomato seedlings, the plants must be handled so that there is no risk of detachment of the scion-rootstock fragments.

These genotypic combinations obtained by "*in vivo*" grafting in this research can be used successfully in the southern part of Romania, for cultivation in a greenhouse on uninfected soil.



Thank you for your attention!